



U.S. NUCLEAR REGULATORY COMMISSION

# STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

## 10.3.6 STEAM AND FEEDWATER SYSTEM MATERIALS

### REVIEW RESPONSIBILITIES

Primary - Materials and Chemical Engineering Branch (~~MTEB~~)(EMCB)<sup>1</sup>

Secondary - None

### I. AREAS OF REVIEW

General Design Criterion 1 requires that systems important to safety shall be designed to quality standards commensurate with the importance to safety of the functions to be performed. General Design Criterion 35 requires suitable interconnections, leak detection, isolation, and contaminant<sup>2</sup> capabilities be provided to assure that the safety system function (i.e., emergency core cooling) can be accomplished, assuming a single failure.

The following areas relating to the general materials considerations for ASME Boiler and Pressure Vessel Code (hereafter "the Code")(~~Reference 11~~)<sup>3</sup>, Section III, Class 2 and 3 components of the steam and feedwater systems are reviewed. The review procedures for materials considerations for steam generators are given in Standard Review Plan Section 5.4.2.1. The ~~e~~Class<sup>4</sup> 2 and 3 components of the main steam and feedwater systems shall be as defined in Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants."<sup>5</sup> Class 1 component materials are covered in Standard Review Plan Section 5.2.3, "Reactor Coolant Pressure Boundary Materials."

DRAFT Rev. 3 - April 1996

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### USNRC STANDARD REVIEW PLAN

Standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for the review of applications to construct and operate nuclear power plants. These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The standard review plan sections are keyed to the Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants. Not all sections of the Standard Format have a corresponding review plan.

Published standard review plans will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience.

Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Washington, D.C. 20555.

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1. Fracture Toughness of Class 2 and 3 Components

The fracture toughness properties and requirements for Class 2 and 3 components are reviewed. Typical components in this review include steam generator shells in PWRs, as well as carbon or low alloy steel portions of steam and feedwater lines in both PWRs and BWRs.

2. Materials Selection and Fabrication

- a. The materials selected for all Class 2 and 3 components and their fabrication are reviewed.
- b. For all components the following points are reviewed:
  - (1) The qualification procedures for welds in areas of limited accessibility are reviewed.
  - (2) The cleaning procedures are reviewed.
  - (3) For tubular products, the nondestructive examination procedures are reviewed for conformance with the ASME Code.
- c. For carbon or low alloy steel components, the controls placed on the welding procedures are reviewed.

3. Erosion/Corrosion

The following areas of erosion/corrosion mitigation for the steam and feedwater systems are reviewed:<sup>6</sup>

- a. Utilization of erosion/corrosion resistant materials.<sup>7</sup>
- b. Specification of an adequate corrosion allowance.<sup>8</sup>
- c. Consideration of minimizing the effects of erosion/corrosion in the design of piping.<sup>9</sup>

Review Interfaces:<sup>10</sup>

EMCB also performs the following reviews under the SRP sections indicated:<sup>11</sup>

- 1. Reviews the adequacy of programs for assuring the integrity of bolting and threaded fasteners as part of its primary review responsibility for SRP Section 3.13 (proposed).<sup>12</sup>
- 2. Reviews the material selection and fabrication process controls for stainless steel as part of its primary review responsibility for SRP Section 5.2.3.<sup>13</sup>

~~MTEB~~In addition, EMCB<sup>14</sup> will coordinate other branches' evaluations that interface with the overall review of steam and feedwater system materials as follows:

1. The<sup>15</sup> Mechanical Engineering Branch (EMEB)<sup>16</sup> reviews the acceptability of the seismic and quality group classifications for system components as part of its primary review responsibility for SRP Sections 3.2.1 and 3.2.2.
2. The review for Quality Assurance is coordinated and performed by the Quality Assurance and Maintenance Branch (HQMB)<sup>17</sup> as part of its primary review responsibility for SRP Sections 17.1 through 17.317.0.<sup>18</sup>
3. The Civil Engineering and Geosciences Branch (ECGB) reviews surveillance programs to verify inclusion of erosion/corrosion monitoring of steam and feedwater system materials as part of its primary review responsibilities for SRP Section 6.6.<sup>19</sup>

For those areas of review identified above as being reviewed as part of the primary review responsibility under other SRP Sections of other branches, the acceptance criteria necessary for the review and their methods of application are contained in the referenced SRP section of the corresponding primary branch.<sup>20</sup>

## II. ACCEPTANCE CRITERIA

The applicable rules and basic acceptance criteria pertinent to the areas of this section of the Standard Review Plan are:

### A1.<sup>21</sup> 10 CFR Part 50, §50.55a - Codes and Standards

This rule requires that structures, systems, and components shall be designed, fabricated, erected, constructed, tested, and inspected in accordance with the requirements of applicable codes and standards commensurate with the importance of the safety function to be performed. (Ref. 1).<sup>22</sup>

### B2. 10 CFR Part 50, Appendix A:

- 1a. General Design Criterion 1 - "Quality Standards and Records." This criterion requires that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. It also requires that appropriate records of the design, fabrication, erection, and testing of structures, systems, and components important to safety shall be maintained by or under the control of the nuclear power unit licensee throughout the life of the unit. (Ref. 2)<sup>23</sup>
- 2b. General Design Criterion 35 - "Emergency Core Cooling." This criterion requires that a system be provided to supply abundant emergency core cooling such that damage to reactor core components is minimal following any loss of reactor coolant. It also requires that the system will have containment capabilities to

assure that the emergency core cooling function can be accomplished, assuming a single failure. For pressure containing components of a critical nature, their containment capability, i.e., their structural integrity, including freedom from brittle fracture, can only be assured by requiring minimum fracture toughness performance of the materials of which they are fabricated. This is a standard industrial practice which is frequently used in construction codes of significant steel structures.

- C3. 10 CFR Part 50, Appendix B - "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." This appendix establishes quality assurance requirements for the design, construction, and operation of those structures, systems, and components of nuclear power plants that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. (Ref. 5)<sup>24</sup>

The following Regulatory Guides provide information, recommendations, and guidance and in general describe a basis acceptable to the staff that may be used to implement the requirements of 10 CFR ~~Part 50, §50.55a~~; 10 CFR Part 50, Appendix A, General Design Criteria 1 and 35; 10 CFR ~~Part 50~~, Appendix B.<sup>25</sup>

- a. Regulatory Guide 1.37, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants."<sup>26</sup> This guide describes methods acceptable to the staff for prevention of intergranular and stress corrosion cracking of austenitic stainless steel and nickel-base alloy components.
- b. Regulatory Guide 1.71, "Welder Qualification for Areas of Limited Accessibility." This guide describes methods acceptable to the staff for providing better control of welder technique in production welding.
- c. Regulatory Guide 1.85, "Materials Code Case Acceptability ASME Section III Division I Materials."<sup>27</sup> This guide lists those ASME Section III Code Cases that are generally acceptable to the NRC staff.

Specific criteria necessary to meet the relevant requirements of the Commission regulations identified above are as follows:

1. Fracture Toughness of Class 2 and 3 Components

The fracture toughness properties of the ferritic materials of these components must meet the following requirements of the Code, Section III, of edition and addenda as invoked by Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants."

NC-2300 - "Fracture Toughness Requirements for Materials" (Class 2)<sup>28</sup>

ND-2300 - "Fracture Toughness Requirements for Materials" (Class 3)

2. Materials Selection and Fabrication

- a. (1) The materials specified for use in Class 2 and 3 components must conform to Appendix I to Section III of the Code, and to Parts A, B, and C of Section II of the Code.
- (2) Regulatory Guide 1.85, "Materials Code Case Acceptability ASME Section III Division I Materials,"<sup>29</sup> describes acceptable code cases that may be used in conjunction with the above specifications.
- b. The following criteria are applicable to all Class 2 and 3 components:<sup>30</sup>
  - (1) Regulatory Guide 1.71, "Welder Qualification for Areas of Limited Accessibility," provides the following criteria for assuring the integrity of welds in locations of restricted direct physical and visual accessibility.
    - (a) The performance qualification should require testing of the welds when conditions of accessibility to production welds are less than 30 to 35 cm (12-14 inches) in any direction from the joint.
    - (b) Requalification is required for different accessibility conditions or when other essential variables listed in the Code, Section IX, are changed.
    - (c) The qualification and requalification tests required by 2.b(1)(a) and (b) above may be waived provided that the joint is to be 100% radiographed or ultrasonically examined after completion of the weldment.<sup>31</sup> Examination procedures and acceptance standards should meet the requirements of the ASME Code Section III. Records of the examination reports and radiographs should be retained and made part of the Quality Assurance documentation of the completed weld.
  - (2) Regulatory Guide 1.37, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants," and ANSI Standard N45.2.1-1973, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants," (Reference 10)<sup>32</sup> describe acceptable procedures for cleaning and handling Class 2 and 3 components of the steam and feedwater systems. Vented tanks with deionized or demineralized water are an acceptable source of water for final cleaning or flushing of finished surfaces. The oxygen content of the water in these vented tanks need not be controlled.
  - (3) Acceptance criteria for nondestructive examination of tubular products are given in the ASME Code, Section III, Paragraphs NB/NC/ND 2550 through 2570.

Technical Rationale.<sup>33</sup>

The technical rationale for application of the above acceptance criteria to the design of steam and feedwater system materials is discussed in the following paragraphs:

1. GDC 1 and 10 CFR 50.55a require that structures, systems, and components be designed, fabricated, erected, constructed, tested and inspected to the highest quality standards commensurate with the importance of the safety function to be performed. The steam and feedwater systems may be relied upon to perform safety functions such as removing decay heat or supplying steam to engineered safety feature pumps. This SRP reviews the selection of and specifications for materials used for these two systems. Regulatory Guide 1.71 provides specific guidance for assuring the quality and integrity of limited visibility welds. Regulatory Guide 1.85 provides guidance for application of ASME code cases to materials selection and fabrication. Meeting the requirements of GDC 1 and 10 CFR 50.55a and the positions of Regulatory Guides 1.71 and 1.85 assures system integrity and the ability to support emergency core cooling.
2. GDC 35 requires that an emergency core cooling system be provided that can remove decay heat following a loss of reactor coolant. The steam and feedwater systems may be utilized to perform safety functions such as removing decay heat or supplying steam to engineered safety feature (ESF) pumps. This SRP evaluates steam and feedwater materials including material fracture toughness properties. By verifying that steam and feedwater system materials meet GDC 35 requirements, assurance is provided that steam and feedwater system integrity will be maintained thereby allowing these systems to fulfill their safety functions of removing decay heat and supplying steam to ESF pumps.
3. 10 CFR 50 Appendix B provides quality assurance requirements for the design, construction, and operation of safety related structures, systems and components of a nuclear plant. The steam and feedwater systems may be relied upon to perform safety functions such as removing decay heat or supplying steam to engineered safety feature pumps. Regulatory Guide 1.37 provides acceptable quality assurance procedures for cleaning and handling of safety-related materials. By meeting the criteria of 10 CFR 50 Appendix B and the positions of Regulatory Guide 1.37, assurance is provided that the steam and feedwater system materials are designed and selected to established Quality Assurance standards, thus providing a high degree of certainty that safety functions will be performed and the health and safety of the public will be protected.

### III. REVIEW PROCEDURES

The reviewer will select and emphasize material from the procedures described below, as may be appropriate for a particular case. To ascertain that the acceptance criteria given in subsection II of this SRP section are met, the reviewer examines the areas listed in subsection I for the required information, in accordance with the following procedures:

#### 1. Fracture Toughness of Class 2 and 3 Components

The reviewer determines which components of the steam and feedwater systems will be made of carbon or low alloy steels, and determines that their fracture toughness properties are in conformance with subsection II.1 of this SRP section.

## 2. Materials Selection and Fabrication of Class 2 and 3 Components<sup>34</sup>

The reviewer determines that the materials proposed for the steam and feedwater systems are in conformance with Appendix I to Section III and to parts A, B, or C of Section II of the Code.

- a. The reviewer determines that the methods for qualifying welders for making welds in locations of restricted direct physical and visual accessibility, and the methods for monitoring and certification of production welds in such areas are in accordance with the acceptance criteria stated in subsection II.2.b(1) of this SRP section.
- b. The reviewer determines that the methods for cleaning and handling the Class 2 and 3 components are in accordance with acceptance criteria stated in subsection II.2.b(2) of this SRP section.
- c. The reviewer verifies that the tubular products are examined in accordance with acceptance criteria stated in subsection II.2.b(3) of this SRP section.
- d. If stainless steel materials are used in the design of the steam or feedwater systems, the reviewer should verify that the applicant has adequately addressed the potential for IGSCC. The reviewer should use the applicable criteria of SRP Section 5.2.3, "Reactor Coolant Pressure Boundary Materials," as they relate to material selection and fabrication process controls for stainless steel.<sup>35</sup>

## 3. Erosion/Corrosion

The reviewer determines that erosion/corrosion resistance has been considered in the design of steam and feedwater systems such that the effects of erosion/corrosion are minimized for the lifetime of the plant. NUREG-1344, "Erosion/Corrosion-Induced Pipe Wall Thinning in U.S. Nuclear Power Plants," (Reference 9) furnishes insight into the phenomena of erosion/corrosion in single-phase piping and provides recommendations for minimizing its effects.

- a. The reviewer determines that piping subject to erosion/corrosion degradation has been designed using erosion/corrosion resistant materials.<sup>36</sup>
- b. The reviewer verifies that the applicant has specified a corrosion allowance accounting for the design life of the plant and that meets Section III of the ASME Code or ANSI/ASME B.31.1, "Power Piping," (Reference 12) as applicable.<sup>37</sup>
- c. The reviewer verifies that the design and layout of piping minimizes the erosion/corrosion effects from fluid velocity, bend locations, and flash points.<sup>38</sup>

## 34.<sup>39</sup> General

If the information contained in the safety analysis report or the plant Technical Specifications does not comply with the appropriate acceptance criteria, or if the information provided is inadequate to establish such compliance, a request for additional information is prepared and transmitted. Such requests identify not only the necessary additional information, but also the changes needed in the SAR or the Technical Specifications. Subsequent amendments received in response to these requests are reviewed for compliance with the acceptance criteria.

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (proposed), to verify that the design set forth in the standard safety analysis report, including inspections, tests, analysis, and acceptance criteria (ITAAC), site interface requirements and combined license action items, meet the acceptance criteria given in subsection II. SRP Section 14.3 (proposed) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.<sup>40</sup>

#### IV. EVALUATION OF FINDINGS<sup>41</sup>

The reviewer verifies that sufficient information has been provided in accordance with the requirements of this SRP section and that his evaluation supports conclusions of the following type to be included in the staff's safety evaluation report:

The staff concludes that the main steam and feedwater system materials are acceptable and meet the relevant requirements of 10 CFR Part 50, §50.55a, 10 CFR 50 Appendix A, General Design Criteria 1 and 35, and 10 CFR 50 Appendix B to 10 CFR Part 50.<sup>42</sup> This conclusion is based on the following:

The applicant has selected materials for Class 2 and 3 components of the steam and feedwater systems that satisfy Appendix I of Section III of the ASME Boiler and Pressure Vessel Code, and meet the requirements of Parts A, B, or C of Section II of the Code. The applicant has also met the recommendations of Regulatory Guide 1.85 which describes acceptable code cases that may be used in conjunction with this industry standard.

When required, the fracture toughness properties of ferritic steel materials satisfy the requirements of the Code. Where the Code allowed fracture testing to be optional, the applicant provided reasonable justification for not requiring fracture toughness testing of ferritic steel components of the main steam and feedwater systems. These fracture toughness tests and mechanical properties required by the Code provide reasonable assurance that ferritic materials will have adequate safety margins against the possibility of nonductile behavior or rapidly propagating fracture.

The applicant has met the requirements of Regulatory Guide 1.71, "Welder Qualification for Areas of Limited Accessibility," by meeting the regulatory positions in Regulatory Guide 1.71 or providing and meeting an alternative to the regulatory positions in Regulatory Guide 1.71, that the staff has reviewed and found to be acceptable. The onsite cleaning and cleanliness controls during fabrication satisfy the position given in



Regulatory Guide 1.37, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants," and the requirements of ANSI Standard N45.2.1-1973, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants."

If austenitic stainless steel is utilized, the review includes appropriate findings from SRP Section 5.2.3, "Reactor Coolant Pressure Boundary Materials," for material selection and fabrication process controls for stainless steel.<sup>43</sup>

For design certification reviews, the findings will also summarize, to the extent that the review is not discussed in other safety evaluation report sections, the staff's evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and combined license action items that are relevant to this SRP section.<sup>44</sup>

## V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using the SRP section.

This SRP section will be used by the staff when performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR 50 or 10 CFR 52.<sup>45</sup> Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed six months or more after the date of issuance of this SRP section.<sup>46</sup>

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides.

## VI. REFERENCES<sup>47</sup>

91. 10 CFR ~~Part 50~~, 50.55a<sup>48</sup>, "Codes and Standards."
12. 10 CFR ~~Part 50~~<sup>49</sup>, Appendix A, General Design Criterion 1, "Quality Standards and Records."
103. 10 CFR ~~Part 50~~<sup>50</sup>, Appendix A, General Design Criterion 35, "Emergency Core Cooling."
114. 10 CFR ~~Part 50~~<sup>51</sup>, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."
3. ~~Standard Review Plan Section 5.4.2.1, "Steam Generator Materials."~~<sup>52</sup>

4. ~~Standard Review Plan Section 5.2.3, "Reactor Coolant Pressure Boundary Materials."~~<sup>53</sup>
5. Regulatory Guide 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants."<sup>54</sup>
76. Regulatory Guide 1.37, "Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants."<sup>55</sup>
67. Regulatory Guide 1.71, "Welder Qualification for Areas of Limited Accessibility."
58. Regulatory Guide 1.85, "Materials Code Case Acceptability ASME Section III Division I Materials."<sup>56</sup>
9. NUREG-1344, "Erosion/Corrosion-Induced Pipe Wall Thinning in U.S. Nuclear Power Plants," April 1989.<sup>57</sup>
810. ANSI Standard N45.2.1-1973, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants."<sup>58</sup>
211. ASME Boiler and Pressure Vessel Code, Section III, subsection NB, NC, and ND, and Appendix I, Section II, Parts A, B, and C: and Section IX; American Society of Mechanical Engineers.
12. ANSI/ASME B.31.1, "Power Piping."<sup>59</sup>

**SRP Draft Section 10.3.6**  
Attachment A - Proposed Changes in Order of Occurrence

Item numbers in the following table correspond to superscript numbers in the redline/strikeout copy of the draft SRP section.

Item	Source	Description
1.	Current PRB names and abbreviations	Editorial change to reflect current PRB name and responsibility for this SRP Section.
2.	Editorial	Corrected typographical error. "Contaminant" was changed to "containment."
3.	SRP-UDP format item, Reference citations	Added parenthetical reference notation to make the citation of references consistent with the SRP-UDP required format.
4.	Editorial	Capitalized "class" in the phrase "class 1 and 2 components" to properly refer to the formal ASME Class designation.
5.	SRP-UDP format item, Reference verification	The title of RG 1.26 was revised to reflect the current correct title.
6.	<b>Integrated Impacts 473, and 483.</b>	Added a new subheading and lead-in text for erosion/corrosion areas of review to be consistent with changes to the Review Procedures subsection.
7.	<b>Integrated Impact 473</b>	Added a review of utilization of erosion/corrosion resistant material to Areas of Review.
8.	<b>Integrated Impact 483</b>	Added the review of an adequate corrosion allowance to Areas of Review.
9.	<b>Integrated Impact 473</b>	Added a review of considering the minimization of erosion/corrosion effects in the design of piping to Areas of Review.
10.	SRP-UDP format item, Reformat Areas of Review	Added "Review Interfaces" heading to Areas of Review. Reformatted existing description of review interfaces to describe how SCSB reviews aspects of Steam and Feedwater Materials under other SRP sections and how other branches support the review.
11.	SRP-UDP Format Item, Editorial	Added typical lead-in sentence for SRP section interfaces that are the responsibility of the same PRB as the subject section.
12.	SRP-UDP Integration of Bolting Issues, <b>Potential Impact 25748.</b>	Added a review interface reflecting reviews of bolting and threaded fastener programs under new SRP Section 3.13.
13.	<b>Integrated Impacts 485, 487, 488, 489.</b>	Added a review interface with SRP Section 5.2.3. Criteria from SRP Section 5.2.3 has been added to the Review Procedures and Evaluation Findings of SRP Section 10.3.6 by the listed integrated impacts. Therefore, an interface with Section 5.2.3 is appropriate.

**SRP Draft Section 10.3.6**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
14.	Current PRB names and abbreviations	Editorial change to reflect current PRB name and responsibility for this SRP Section.
15.	Editorial	Added the article "The" to clarify the sentence.
16.	Current PRB names and abbreviations	Editorial change to reflect current PRB name and responsibility for SRP Sections 3.2.1 and 3.2.2.
17.	Current PRB names and abbreviations	Editorial change to reflect current PRB name and responsibility for SRP Sections 17.1 through 17.3.
18.	Reference Verification	Replaced "17" with "17.1 through 17.3" to correspond with actual SRP Section numbers.
19.	<b>Integrated Impact 473</b>	Added a Review Interface for SRP Section 6.6 to verify that erosion/corrosion monitoring is included in the surveillance program.
20.	Editorial	Revised the Review Interfaces closing paragraph for applicability to both EMCB and other PRB interfaces.
21.	Editorial	Acceptance Criteria designations were changed from numbers to letters for clarity. Subsequent paragraphs and subparagraphs were redesignated accordingly.
22.	SRP-UDP format item, Reference citations	Deleted "(Ref 1)" to make the citation of references consistent with the SRP-UDP required format.
23.	SRP-UDP format item, Reference citations	Deleted "(Ref 2)" to make the citation of references consistent with the SRP-UDP required format.
24.	SRP-UDP format item, Reference citations	Deleted "(Ref. 5)" to make the citation of references consistent with the SRP-UDP required format.
25.	SRP-UDP format item, Reference citations	The citation of three 10 CFR 50 references were reformatted for consistency with SRP-UDP guidance.
26.	SRP-UDP format item, Reference verification	The title of RG 1.37 was revised to reflect the current correct title.
27.	SRP-UDP format item, Reference verification	The title of RG 1.85 was revised to reflect the current correct title.
28.	Editorial	A line space was added after the first NC-2300 entry for clarity.
29.	SRP-UDP format item, Reference verification	The title of RG 1.85 was revised to reflect the current correct title.
30.	Editorial	Added "for Class 2 and 3 components" to clarify the applicability of this criteria.
31.	Editorial	The reference to "2.c(1)(a) and (b)" was corrected to the proper reference of "2.b(1)(a) and (b)."

**SRP Draft Section 10.3.6**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
32.	SRP-UDP format item, Reference citations	Added parenthetical reference designation to make the citation of references consistent with the SRP-UDP required format.
33.	SRP-UDP format item, Develop Technical Rationale	Added Technical Rationale for GDC 1 and 35, 10 CFR 50.55a, and 10 CFR 50 Appendix B. Technical Rationale is a new SRP-UDP format item.
34.	Editorial	Added "of Class 2 and 3 Components" to clarify the applicability of this Review Procedure.
35.	<b>Integrated Impacts 485, 487, 488, and 489</b>	All of these integrated impacts deal with various controls and design considerations when using austenitic stainless steel. Steam and feedwater systems do not normally use stainless steel. However, on a case by case basis, stainless steel may be used in specific erosion/corrosion control applications. For these unique situations, the reviewer is referred to the austenitic stainless steel controls in SRP Section 5.2.3, "Reactor Coolant Pressure Boundary Materials."
36.	<b>Integrated Impact 473</b>	Added a heading, introductory sentence, and new review procedure regarding erosion/corrosion.
37.	<b>Integrated Impact 483</b>	Added a Review Procedure to verify specification of appropriate corrosion allowances.
38.	<b>Integrated Impact 473</b>	Added a new review procedure item regarding designing piping to minimize erosion/corrosion.
39.	Editorial	This review procedure was renumbered due to the addition of a review procedure above.
40.	SRP-UDP Guidance, Implementation of 10 CFR 52	Added standard paragraph to address application of Review Procedures in design certification reviews.
41.	Editorial	"OF" was deleted in the title of the Evaluation Findings Subsection for consistency with other SRP Sections.
42.	SRP-UDP format item, Reference citations	The citation of three 10 CFR 50 reference were reformatted for consistency with SRP-UDP guidance.
43.	<b>Integrated Impacts 485, 487, 488, and 489</b>	All of these integrated impacts deal with various controls and design considerations when using austenitic stainless steel. Steam and feedwater systems do not normally use stainless steel. However, on a case by case basis, stainless steel may be used in specific erosion/corrosion control applications. For these unique situations, the reviewer is referred to findings related to austenitic stainless steel controls in SRP Section 5.2.3, "Reactor Coolant Pressure Boundary Materials."
44.	10 CFR 52 applicability related change	Standard design certification (DC) terminology was added to the Evaluation Findings section.

**SRP Draft Section 10.3.6**  
Attachment A - Proposed Changes in Order of Occurrence

Item	Source	Description
45.	SRP-UDP Format Item	Added boiler-plate text to Implementation subsection to incorporate 10 CFR 52.
46.	SRP-UDP Format Item	Added boiler-plate text to Implementation subsection to address applicability of the section to existing and future applications.
47.	SRP-UDP format item	References were rearranged and renumbered to be consistent with SRP-UDP guidance.
48.	SRP-UDP format item, Reference citations	The citation of a 10 CFR 50 reference was reformatted for consistency with SRP-UDP guidance.
49.	SRP-UDP format item, Reference citations	The citation of a 10 CFR 50 reference was reformatted for consistency with SRP-UDP guidance.
50.	SRP-UDP format item, Reference citations	The citation of a 10 CFR 50 reference was reformatted for consistency with SRP-UDP guidance.
51.	SRP-UDP format item, Reference citations	The citation of a 10 CFR 50 reference was reformatted for consistency with SRP-UDP guidance.
52.	SRP-UDP Format Item	Deleted reference listing of SRP Section 5.4.2.1 - SRP references are not listed in subsection VI.
53.	SRP-UDP Format Item	Deleted reference listing of SRP Section 5.2.3 - SRP sections are not listed in subsection VI.
54.	SRP-UDP format item, Reference verification	Added RG 1.26 to list of references. This document is cited in the SRP but was previously not listed in the References subsection.
55.	SRP-UDP format item, Reference verification	The title of RG 1.37 was revised to reflect the current correct title.
56.	SRP-UDP format item, Reference verification	The title of RG 1.85 was revised to reflect the current correct title.
57.	<b>Integrated Impact 473</b>	Added an applicable erosion/corrosion reference which is cited in the section text.

**SRP Draft Section 10.3.6**  
**Attachment A - Proposed Changes in Order of Occurrence**

<b>Item</b>	<b>Source</b>	<b>Description</b>
58.	<b>Integrated Impact 482</b>	In the System 80+ FSER, the staff indicated that ANSI N45.2.1 was superseded by NQA-2. However, per an 11/94 conversation with Quality Assurance and Maintenance Branch staff, N45.2.1 requirements are being incorporated into NQA-1 and NQA-2. RG 1.28, Revision 3 endorsed NQA-1. NRC has a program to revise the endorsement based on the results of an evaluation of the graded QA program. Also NQA is going through a review of both standards. Per an 11-10-94 telecon with Office of Research staff, two draft regulatory guides were prepared to endorse NQA-1 and NQA-2 through their 1993 addenda. Both regulatory guides were put on hold due to NRC/NEI work on the graded QA program. In the interim, NQA-1 and NQA-2 were consolidated into a new NQA-1. No changes will be made to the SRP pending staff resolution of this issue.
59.	<b>Integrated Impact 483</b>	Added an applicable corrosion allowance reference which is cited in the section text.

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**SRP Draft Section 10.3.6**  
Attachment B - Cross Reference of Integrated Impacts

<b>Integrated Impact No.</b>	<b>Issue</b>	<b>SRP Subsections Affected</b>
473	Consider modifying this section to address the use of erosion/corrosion resistant materials in steam and feedwater systems.	-Subsection I, Areas of Review, new items 1 and 3, new Review Interface -Subsection III, Review Procedures, items 3, 3.a, and 3.c -Subsection VI, References, new reference 5
482	Consider revising this section to update references to cleaning and cleanliness control.	None - This Integrated Impact will not be processed pending staff action on NQA-1.
483	Consider modifying this section to address appropriate corrosion allowances for steam and feedwater system materials.	-Subsection I, Areas of Review, new item 2 -Subsection III, Review Procedures, item 3.b -Subsection VI, References, new reference 14
484	Consider modifying this section to address steam and feedwater system materials impurity controls.	None - This proposed change appears to be a Type II change.
485	Consider modifying this section to address controls on grinding for steam and feedwater system materials.	-Subsection III, Review Procedures, item 2.d -Subsection IV, Evaluation Findings, new paragraph
486	This Integrated Impact identifies a future work issue to consider revising RG 1.37 regarding cleaning and cleanliness controls.	None
487	Consider modifying this section to address the adequacy of austenitic stainless steel to resist intergranular stress corrosion cracking (IGSCC) for steam and feedwater system materials.	-Subsection III, Review Procedures, item 2.d -Subsection IV, Evaluation Findings, new paragraph
488	Consider modifying this section to address control of sensitized stainless steel for steam and feedwater system materials.	-Subsection III, Review Procedures, item 2.d -Subsection IV, Evaluation Findings, new paragraph
489	Consider modifying this section to address controls on ferrite content of austenitic stainless steel weld metal for steam and feedwater system materials.	-Subsection III, Review Procedures, item 2.d -Subsection IV, Evaluation Findings, new paragraph